



RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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April 7, 1999

James Shafer, Remedial Project Manager
U.S. Department of the Navy
Northern Division
Naval Facilities Engineering Command
10 Industrial Highway
Code 1823-Mail Stop 82
Lester, PA 19113-2090

RE: Draft Ecological Risk Assessment, Naval Station Newport, Newport, Rhode Island

The Department of Environmental Management Office of Waste Management has reviewed the Ecological Risk Assessment for the Old Fire Fight Training Area. Attached are comments generated as a result of this review. If the Navy has any questions concerning the above, please contact this Office at (401) 222-2797, ext. 7111.

Sincerely,

A handwritten signature in cursive script that reads "Paul Kulpa".

Paul Kulpa, Project Manager
Office of Waste Management

cc: Warren S. Angell, DEM OWM
Richard Gottlieb, DEM OWM
Christopher Deacutis, DEM OWR
Robert Richardson, DEM OWR
Kymerlee Keckler, EPA Region I
Melissa Griffen, NETC

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**Comments on the
Draft Old Fire Fighter Training Area
Marine Ecological Risk Assessment Report**

1. General Comment

Throughout the report comparisons to the background station are made. Therefore the report should include a discussion of background station. This discussion should note, amongst other things, whether there are any potential sources of contamination at this background station, whether the observed concentration of contaminants at the background station are within the values expected for an unimpacted area, etc. The report should also include a comparison of the reference station used for OFFTA with the ones employed for Derecktor Shipyard and McAllister Point Landfill.

2. General Comment

Please indicate whether all of the contaminants detected in the soil and the groundwater samples were analyzed for in the sediment and tissues samples collected for the Ecological Risk Assessment.

3. General Comment

It is known that free product was detected at the site. In addition, it is known that petroleum products contain a wide range of compounds, many of which are not detected in standard VOC/SVOC runs. Therefore, as this is a public document the report should state why a simple TPH analysis was not performed on the sediment samples.

4. General Comment

The report should note what procedures were employed in the risk ranking if a compound was not analyzed for, collected, rejected or evaluated at a particular sample station.

5. Section 1.6.1, Exposure Based Weight of Evidence, Resuspended Sediment Effects, Page 1-5 Paragraph 2.

This section of the report states that the results of the elutriate test, which are designed to mimic resuspension, reveal an overall lower risk than that of the porewater or bulk sediment. This would seem to support the Offices concern that the elutriate test, being a four to one dilution, does not accurately reflect

resuspension conditions. The report should therefore factor in the four to one dilution for the elutriate test.

6. Figure 1.2.1, Sampling Stations

Please include a figure that depicts what was sampled for or what analysis was performed at each sampling stations, ie. depth of sample, chemistry biotoxicity, various tissue analysis, deployments, collections, community structure, etc..

**7. Section 3.3, Contaminants of Concern,
Page 3-16, Paragraph 2.**

The bench marks employed for determining contaminants of concern are equivalent to those employed in the draft Ecological Risk Assessment for Dereecktor Shipyard dated July 1996. Please indicate whether any other benchmark from other states or other Regions, have been developed since that time. It is the Office's understanding that Region IV and New Jersey are developing or have developed sediment screening values. These values should be incorporated into the report. The Office recommends investigating whether the other coastal states or Regions have developed standards.

**8. Section 4.1, Sources and Exposures Pathways of CoCs,
Page 4-3, Paragraph 2.**

This section of the report states that the concentration of organic contaminants in aquatic organisms is based upon lipid content of the organisms and not due to other factors such as biomagnification. That is the external surface of the respiratory systems of water borne organisms facilitate the transfer of lipid soluble contaminants and thus biomagnification is not present. This would seem to imply that respiratory systems of aquatic organisms have a detoxification function, and as such contaminants absorbed by the organism, through ingestion, respiration or dermal content is removed via the respiratory system. Since biomagnification is known to exist in the aquatic environment, please indicate whether any other studies other than the 1977 reference support his position.

**9. Section 4.1, Sources and Exposures Pathways of CoCs,
Page 4-4, Paragraph 1.**

This section of the report indicates that PAHs do not bioaccumulate in organism. As the report states it is known that PAHs are rapidly metabolized, and the metabolites themselves may be more harmful than the original PAHs. The report should note whether the PAH metabolite bioaccumulate.

**10. Section 4.1, Sources and Exposures Pathways of CoCs,
Page 4-4, Paragraph 1.**

This section of the report states combusted forms of PAHs are more highly particle bound than what is suggested by their chemical structure. Please provide the basis for this statement.

**11. Section 4.3.1 Trace Metal Contaminants,
Page 4-12, Paragraph 3.**

This section of the report states that cores were taken at twelve of the twenty three stations. For completeness the report should note the criteria which was used to select the core stations, i.e. observed contamination in the surface sediments, spatial coverage, etc.

**12. Section 4.3.1.1, Sediments,
Page 4-13, Whole Section.**

The report should note whether the concentration of organic and inorganic contaminants increase or decrease with depth.

**13. Section 4.3.1.1, Sediments,
Page 4-13, Paragraph 3.**

This section of the report notes that trace metal concentrations are dependent upon sediment size. As this is a public document the report should explain why this is so.

**14. Section 4.3.1.1, Sediments, Simultaneously Extracted Metals,
Page 4-15**

This section of the report deals with SEM and AVS. The report should note at what time of the year this measurement was taken. In addition the report should note the seasonality aspects of AVS/SEM and what effect this would have on contaminant availability.

**15. Section 4.3.1.1, Sediments, Simultaneously Extracted Metals,
Page 4-15**

This section of the report deals with SEM and AVS. The report should note that the AVS/SEM discussions refer to static conditions and that resuspension of the sediments will affect their bioavailability.

**16. Section 4.3.1.2, Porewater,
Page 4-16, Paragraph 2.**

This section of the report states that mercury values were not used due to insufficient sample volume. As discussed in previous correspondence the mercury values are valid and should be treated as such in this report.

**17. Section 4.3.1.3, Elutriates,
Page 4-17, Paragraph 1.**

The report states that elevated levels of copper were observed at the reference station. Please indicate if there is a known source in the area that would account for the observed levels.

**18. Section 4.3.1.4, Tissue Residues (metals),
Page 4-18, Paragraph 2.**

This section of the report discusses the background concentrations of metals in indigenous mussels. Please indicate whether the concentrations observed in these mussels were similar to that observed at other the other reference stations used in the McAllister Point and Derektor Shipyard ecological risk assessments.

**19. Section 4.3.1.4, Tissue Residues (metals),
Page 4-18, Paragraph 3.**

This section of the report states the deployed mussels results could not be compared to the indigenous results. In order to avoid confusion the report should state that while the results are not comparable, the information obtained from the deployed mussels would be used in the risk assessment for those sampling stations.

**20. Section 4.3.2.4, Tissue Residues,
Page 4-28, Whole Section.**

It is not clear from this section of the report whether tissue samples analyzed for mercury, from all the species collected, including cunner were included in this section of the report. As stated in previous correspondence, the Office considers all of the tissue samples analyzed for mercury as valid and should be considered such in the report.

**21. Section 5.0, Toxicity Evaluations,
Page 5-50, Whole Section**

This section of the report discusses the different toxicity test performed on the sediments and water samples. As these are standardized test the report should include a table that lists the typical cut off values inherent in these test. In

addition, the report should include a discussion of the standard interpretation of these values.

**22. Section 5.2.1, Bulk Sediment Evaluations, Data Analysis,
Page 5-53, Paragraph 1.**

Significant toxicity for Ampelisca abdita has been defined as survival statistically less than the performance control and 80 % of the mean control survival.

This section of the report states that significant toxicity is defined as survival less than 80 % of the control. This appears to be in conflict with Table 6.0-2 which assigns a low risk value to samples which are less than 80 % of the control. As this is a public document this apparent discrepancy should be clarified in the report.

**23. Section 5.2.2, Sediment Pore Water Evaluation, Results.
Page 5-56, Paragraph 2.**

The toxicity to ammonia is dependent upon pH and other factors. Therefore as was done for the bulk sediment analysis this relationship should be addressed for the sediment pore water analysis.

**24. Section 5.2.3, Sediment Elutriate Evaluations, Results.
Page 5-57, Paragraph 4.**

Elutriates are obtained by mixing one part sediment with four parts water. This is essentially a dilution and should be noted as such in the report.

**25. Section 5.2.3, Sediment Elutriate Evaluations, Results.
Page 5-57, Paragraph 4.**

This section of the report states that at $C > 100\%$ elutriates were able to exhibit a toxic response only at very high concentrations or not at all. This statement is confusing in that it would seem to indicate that one was not able to determine if there was or was not toxicity at 100 %. The report should clearly indicate for the individual samples whether toxicity was observed at 100 % or not. In addition, in the ramifications for observing toxicity at 100 % as opposed for not observing toxicity should be discussed in relationship to the risk ranking.

**26. Section 5.3.1, Infaunal Distribution and Abundance.
Page 5-58, Paragraph 1.**

This section of the report should include a discussion comparing the reference stations to what would be expected at non impacted locations.

**27. Section 5.3.1.2, Benthic Community Assessment Protocols
Page 5-62, Whole Section**

This section of the report deals with the biotic condition analysis conducted at the site. In addition to listing the different species found at the sampling locations the report should note which species are pollution tolerant and intolerant. Furthermore, the report should include a narrative which discusses whether the organisms found at a particular sampling station was composed of primarily pollution tolerant or intolerant species and the importance of these observations. Finally, pollution tolerance or intolerance should be related to the contaminants of concern.

**28. Section 5.3.1.2, Benthic Community Assessment Protocols
Page 5-62, Whole Section**

This section of the report includes a discussion of the different indexes that were used to analyze the data. The significance of the values obtained from these indices has not been included for all the assessment which were conducted. As an illustration, the Shannon Weiner Diversity Index was performed at the site. However, the significance of the values obtained, the critical values and the limitations of the analysis was not discussed in the report. Please modify the report accordingly.

**29. Section 5.3.1.2, Benthic Community Assessment Protocols
Page 5-62, Whole Section**

This section of the report should note whether conflicting results were obtained for the different assessments performed at the sites. That is whether one assessment indicate a problem and the other did not.

**30. Section 5.3.1.2, Infaunal Community Assessment Results, Benthic Community Assessment.
Page 5-66, Paragraph 2.**

Ranges were calculated using an arbitrary division system dividing the benchmark values into ranges.

The above states that an "arbitrary division system" was used to segregate the various matrixes and determine the final ranking, low, intermediate or high. This would by definition translate into an arbitrary ranking system. One of the results of this approached is that a sample with only fifty percent of the matrix of the reference station is ranked as a low risk. In essence a sampling locations with half of the number of individuals or diversity may be given a low risk. Therefore, the ranking system should revised and the arbitrary division should be replaced by one reflective of risk.

31. **Section 5.3.1.2, Infaunal Community Assessment Results, Benthic Community Assessment.**
Page 5-66, Paragraph 2.

Ranges were calculated using an arbitrary division system dividing the benchmark values into ranges.

This section of the report employs an "arbitrary" ranking system to segregate the results of the various indexes and evaluations employed in this study. This approach ignores the critical values used in these indexes and therefore may generate misleading results. As an illustration, the Shannon Weiner Diversity Index is tool used to access diversity at individual sampling stations. The equations employed in this index contain certain critical values that are designed to access the diversity at the sampling location. An H value of one or below indicates low diversity; an H value of three or above indicates high diversity. The arbitrary quantiles method employ four sets of critical values < 0.64, 0.64-1.6, 1.6-2.55, >2.55. These values are then use to translate into baseline, low, intermediate, medium and high risk. Employing this arbitrary system totally ignores the critical values called for in the Shannon Weiner Diversity Index and adds a degree of sophistication that the index is not designed to do. Therefore, as this is a public document this section of the report should be revised. In addition, as requested above the report should discuss critical values, data requirements, limitations, false positive and negatives for each index used in the report.

32. **Section 6.0, Risk Characterization, Whole Section.**

Throughout this section of the report the results of the toxicity test, tissue analysis, benthic community evaluations, etc are compared to potential chemicals of concern. It is the Offices understanding that these evaluations are qualitative in nature and are not used to modify the overall risk ranking. As an illustration the individual risk ranking for chemicals of concern detected at a sampling location would not be affect if there was not an observed tissue affect or toxicity effect and vice versa. Please confirm.

33. **Section 6.6.1 Exposure Based Weight of Evidence, Sediment Toxicity.**
Page 6-44, Paragraph 2.

This section of the report indicates that an intermediate risk value was employed to stations which did not have multiple exceedence of ER-M and a low ranking was assigned to stations which had one exceedence of a ER-M. The magnitude of an exceedence is as important as the number of exceedence . Therefore, this section of the report should be modified in such a manner that the magnitude of an exceedence is also considered.

**34. Section 6.6.1 Exposure Based Weight of Evidence, SEM Bioavailability.
Page 6-44, Paragraph 3.**

This section of the report discusses SEM bioavailability in the assignment of exposure categories. The Office has indicated that SEM values are seasonally and may not reflect the true exposure to an organism. This seasonality should be factored into this section and this evaluation should be changed accordingly.

**35. Section 6.6.1 Exposure Based Weight of Evidence, Porewater Hazard Quotients.
Page 6-45, Paragraph 2.**

This section of the report states that the same criteria was applied to pore water that was applied to sediment. Similar to sediment the magnitude of an exceedence should be factored into this analysis.

**36. Section 6.6.1 Exposure Based Weight of Evidence, Bioconcentration Ranking.
Page 6-48, Paragraph 1.**

This section of the report states that a low exposure training was given if no COC exceeded a ten fold elevation above baseline. This appears to be a typographical error and should read that a low exposure was given if no COC was found above three times baseline.

**37. Section 6.6.1 Exposure Based Weight of Evidence, Bioconcentration Ranking.
Page 6-48, Paragraph 1.**

The remaining stations were assigned baseline exposure as no COC elevation in species tissues were three-fold above reference.

The above appears to contain a typographical error. The above should read that The remaining stations were assigned baseline exposure as no COC elevation in species tissues were above reference.

38. Table 6.02, Indicator specific and Overall Weight of Evidence Ranking for Effects Concentrations.

Bedded/Resuspended Sediment Toxicity. This section of the report provides cut off values for assign low and intermediate risk based upon survival or development rates. The report is a public document and therefore justification should be provided for the different cutoff values. As an illustration, as presented a low risk value is assigned for a sampling site in which forty percent of the organisms died.

39. Table 6.02, Indicator specific and Overall Weight of Evidence Ranking for Effects Concentrations.

Benthic Community Structure. This section of the report provides critical values for the assessment of benthic community structure. Justification should be included for the selected cut off values. As an illustration, as written in the table a low risk is applied to sites that have a community matrix equal to fifty percent of the reference station.

40. Table 6.02, Indicator specific and Overall Weight of Evidence Ranking for Effects Concentrations.

Tissue Residue Effects. Indicator Test Specific Rankings. Intermediate and high risk rankings appear to be reversed.

41. Table 6.02, Indicator specific and Overall Weight of Evidence Ranking for Effects Concentrations.

Tissue Residue Effects. Indicator Test Specific Rankings. Please change TSC>40 to TSC>10. Avian Predators please change HQ>40 to HQ >10.